TIFFANY (L. McL)

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OSTEO-SARCOMA OF THE FEMUR.[1]

BY LOUIS McLANE TIFFANY, M.D.,
Professor of Surgery in the University of Maryland.

GENTLEMEN,—The patient whom I show you to-day comes to us from a distant part of the State, having been brought here by his physician, who is now present. His history is as follows:

CASE I.—Male, white, aged twenty-nine, has had for six or eight years an increasing enlargement just above the right knee. He is a strong, active man, living in the country, and until recently has been able to attend to his ordinary avocation, that of a farmer. He dates the commencement of his disease from a fall, the outer surface of his thigh having been contused. Especially painful was it where the tumor now grows. He paid no attention to the injury at the time, but within six months noticed a tumefaction, which has gradually increased up to the present time. His bodily functions are well performed, and he suffers little or no pain, the main discomfort arising from the weight and unwieldiness of the affected member. Physical examination of the growth shows a large fusiform tumor apparently involving the lower third of the femur, which is here about double the size of the other thigh at the corresponding point. The growth in the vicinity of the knee-joint is hard and inelastic, being apparently bony. Above and to the outer side there exists a cyst, which contains about a pint of fluid of some sort. The tumor is intimately united with the femur, is not movable, and does not encroach sufficiently upon the knee-joint to give rise to much trouble. It does not project into the popliteal space. The muscles play over it. The patella is movable, and the patient walks without pain. The temperature of the growth is about two degrees higher than that of the corresponding point in the other thigh. His pulse is normal, digestion good, and appetite good. He has not lost flesh lately. The glands in the groin are perceptible on the right side, and scarcely if at all on the left. Elsewhere throughout the body the glands are not enlarged. The lungs are normal. The diagnosis is osteo-sarcoma of the right femur, with a cystic formation in the outer aspect of the thigh.

The patient is advised to enter the hospital and submit to amputation. This advice he will take under consideration and will most probably appear before you again.

Sarcoma of bone is not infrequent, it being the most frequent form of tumor connected with the osseous structure, and the term osteo-sarcoma is a general one used to indicate the seat from which the tumor grows as well as the kind of tumor which may be present. Sarcoma, as you know, is a connective-tissue tumor, and, therefore, finds its seat in bone, which is also

[1] Clinical lecture delivered in the University Hospital.

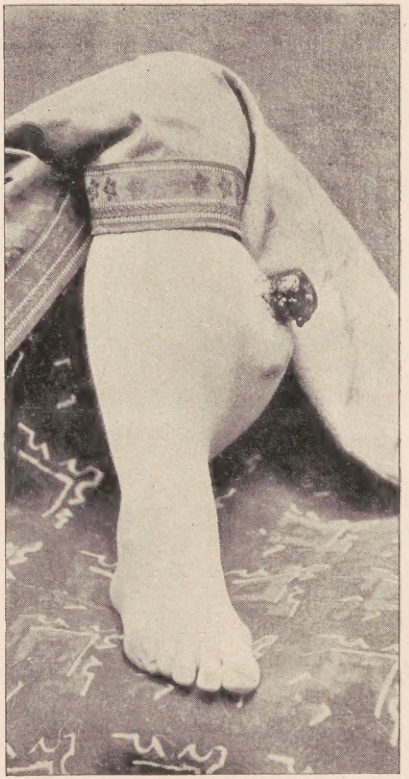
a connective tissue. Sarcoma is composed of two elements,—cells, and cellular tissue more or less distinct, usually, however, in scanty amount, blood-vessels, nerves, etc., and according as the cells of which the tumor is composed are large or small, round or elongated, so are the terms small cells, spindle cells, myeloid cells, etc., made use of. A further classification is made from the locality where the growth originates. A central or periosteal sarcoma may be either spindle- or round-celled, etc. It is usual in speaking of sarcoma to define both from microscopic structure and seat of growth. Thus, we speak of the small cell, periosteal sarcoma, of the spindle cell, central sarcoma, etc. Sarcomata are with other connective-tissue tumors more often seen in the first half of life, making their appearance, as a general rule, before the age of thirty. They are far more often seen in the long than in the irregular bones, and, while choosing such bones, they will choose the epiphysis more often than the shaft of the bone. The lower end of the femur and the upper end of the tibia are the two chosen seats, the next in frequency being the upper end of the humerus, but the fact that this kind of tumor is so often seen about the knee-joint will enable you to understand how often knee-joint troubles may be confounded with the growth in question, and it is a matter of very general experience to find difficulty in distinguishing between the knee-joint disease and the sarcoma growing immediately adjacent to the joint, and perhaps invading it, although this is very rare and takes place only when the disease is far advanced. The articular cartilage is very often preserved intact, although the sarcoma tissue may be all about it.

The origin of osteo-sarcoma is very generally referred, by the patient, to some injury, so often indeed as to justify the opinion that traumatism does have much to do with the commencement of the growth. Except from injury I know of no cause. The injury may be slight, and it is very difficult in such cases to suppose that the growth did come from such an insignificant cause. In other cases, however, the history is so very clear as to leave no doubt.

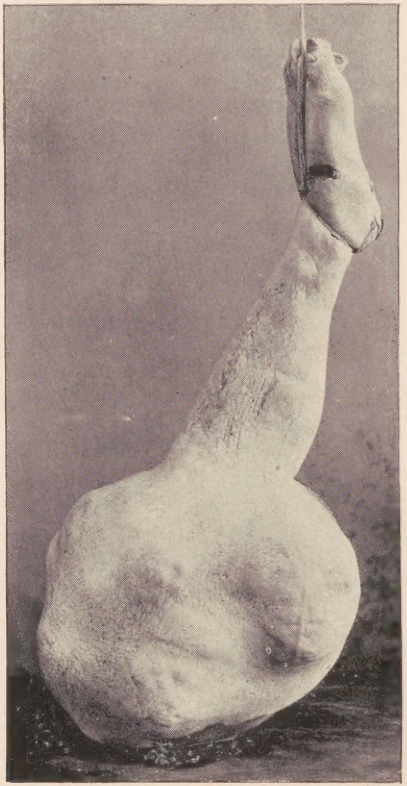
Such a case is the one whose photograph I now show you. The history is as follows:

CASE II.—M. L., white female, aged nineteen, large and well-developed, five years before being seen by me, in running across the street, tripped and fell, striking her right tibia about the middle against the curb-stone. She suffered much pain, and after the bruise from the injury had disappeared, a thickening apparently of the periosteum remained. Two years later this thickening slowly began to increase, until, when I saw it, it was decidedly larger than an adult head. The skin had given way and a bleeding fungus protruded. I amputated through the right thigh, and all went well.

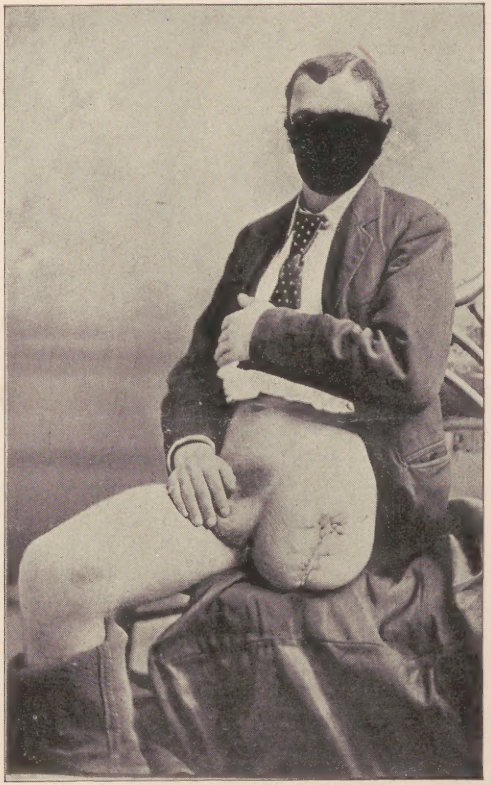
I do not think that hereditary tendency can be made out. The shape of the sarcoma will vary. When myeloid it is apt to be rounded, and perhaps bossed. It may be covered entirely by bone or plates of bone, which latter can be found at irregular intervals over its surface. If of slow growth, the



CASE II.—SARCOMA OF RIGHT TIBIA. The microscope showed spindle, round, and myeloid cells.



CASE III.—SARCOMA OF LEFT FEMUR. The photograph is from the Army Medical Museum, Washington, to which the amputated limb was sent.



CASE IV.—AMPUTATION AT HIP-JOINT BY LATERAL FLAPS. Spindle cells greatly predominating.

myeloid sarcoma is very apt to remain covered with bone. Periosteal sarcoma, on the other hand, is usually fusiform in shape, and may involve the greater portion of the shaft of the bone. It is rarely entirely covered by bone, but may present irregular bone formations on the surface. When not covered by bone, the consistency of the tumor will vary according as it is a round or spindle-celled sarcoma. The former is the more soft, so much so as to give a sense of pseudo-fluctuation. I would call your attention here to a point in regard to the consistency of the tumor which may assist you in your diagnosis, as it has me on more than one occasion; and that is that the consistency of the sarcoma, if not covered by bone, will be found to vary. Thus, a patient from a distance is examined to-day, and then put to bed at rest. On the next day the tumor will be less tense, and may show apparent fluctuation. This change is probably due to a different vascular tension brought about by the rest to which the patient has been subjected during the twenty-four hours; and it is this enforced rest during doubtful cases which has assisted in a difficult diagnosis.

The size of the tumor varies within extreme limits. The largest which it has been my fortune to see was one for which I amputated at the hip last week. The tumor was fifty inches in circumference, and weighed, after much blood had drained away, fifty-nine and a quarter pounds. I show the photograph.

CASE III.—The patient was a white male but little over thirty years of age. The tumor had been growing for thirteen years, and was covered by bone. I amputated at the hip by Furneaux Jordan's method, and the patient recovered.

Adjacent glands are affected rarely, that being one of the characteristics of sarcoma as distinguished from carcinoma. In some few cases, if enlarged, the glands may go down after amputation, although this is rarely to be expected. The glands are not affected during the early life of a growth, but still they should always be searched for, not only adjacent to the growth, but all over the body. On the other hand, pulmonary metastasis is to be looked for always, and in a certain number of cases will be found present. Some varieties of sarcoma are far less likely to reproduce themselves in other parts of the body than others; thus, myeloid sarcoma is very rarely infectious. Some of the small-celled sarcomata, however, are extremely so. Local infection is usually not noticed until a sarcoma has broken through its bony or fibrous envelope. So long as the sarcoma remains surrounded by bone it is apt to grow slowly. When it escapes from its bony prison, however, it grows with great rapidity. This is especially the case, also, when it protrudes through the skin; then the increase is extremely rapid, and is accompanied by frequent loss of blood. Indeed, the loss of blood from an open sarcoma may be sufficient to blanch the patient, and, if frequently repeated, will induce death.

The temperature of a growing sarcoma is higher than that of normal tissue, and will aid you in recognizing the growth. Should a surface

thermometer not be at hand, an ordinary clinical thermometer placed upon the limb and covered with cotton may be taken as a fairly exact index of the temperature of the growth. It should be left in position not less than five minutes; and if the same manipulation is gone through with the corresponding part of the body on the other limb, a difference will be noted.

Plates of bone on the surface of the growth point to sarcoma, as does also an elastic, thin, crackling envelope of bone.

The rate of growth presents great variations. The large tumor (Case III.) about which I spoke to you a few moments ago grew continuously during thirteen years, and when amputated by me was covered by bone.

The treatment is simple. Enucleation does not suffice. Amputation is called for. The amputation must be sufficiently far from the growth to avoid recurrence *in situ*. Wherever possible, the entire bone which is the seat of the tumor should be removed, since the medullary canal may be infected quite a distance from the primary growth, or the proximal extremity of the bone may contain a nodule. Possibly the femur is the only bone the whole of which it is best sometimes not to remove when the lower extremity is the seat of sarcoma; and hip-joint amputation is not always to be done, because it is followed in so many cases by fatal results. The humerus, tibia, etc., however, should be removed in their entirety. Adjacent glands should be explored thoroughly after the amputation is done, since glands not noticed prior to amputation may come into view when the skin is opened. I think it is unwise also to use Esmarch's bandage for the purpose of rendering less vascular the extremity, especially if the entire bone which is the seat of morbid growth is not to be extirpated, since fragments of the growth may be forced towards the proximal extremity of the bone.

CASE IV.—Showing stump after hip-joint amputation for osteo-sarcoma, involving the middle third of the femur. Amputation done November, 1881.